

We All Live in Bhopal

On December 3rd, 1984, one of the world's worst industrial accidents occurred at the Union Carbide plant in Bhopal, India. Three weeks ago, McGill pharmacologist, Dr. Daya Varma, criticized the lax safety precautions of both Union Carbide and the Indian government.

Union Carbide is one of the U.S.'s largest chemical companies, employing 100,000 worldwide. Immediately after the accident, company officials denied allegations that safety precautions at the plant were poor. Union Carbide chairperson Warren Anderson tried to calm fears, saying the chemical industry is one of the "safest" in the world. In a 1985 interview he said, "It never occurred to anyone that this would happen. I didn't want to get in the Guinness Book of World Records for the world's worst industrial accident."

by Mathew Copas

According to Varma, Anderson said people were ten times safer in the plant than they were at home. "Unfortunately he (Anderson) proved to be right because nobody working at the plant died, but people at home... well."

Union Carbide officials continue to blame the disaster on sabotage, despite a wealth of information to the contrary. The Indian government disagrees strongly with the sabotage claim. "Expected safety precautions were not observed," said Varma.

The methyl isocyanate (MIC) producing Bhopal plant was built in the 1960s. Varma speculated that Union Carbide, and other multinationals, may have established foreign operations in poorer countries in order to avoid tougher environmental protection laws at home.

Varma outlined a number of safety precautions in the plant which were not fully operational:

- The four tanks containing MIC should not have all been full. There was no empty tank in the event of an emergency.
- MIC has a boiling point of 39 degrees Celsius. The required refrigeration was not in operation.
- There should have been a third tower to capture escaping gas and burn it. The tower was not in operation.
- A 'scrubber' to neutralize escaping gas was not in operation.
- Gauges to monitor pressure in tanks were not in operation.

According to Varma, one of the MIC tanks was open. Water leaked into it, creating heat and vaporizing the MIC. Under pressure the gases

escaped, engulfing the surrounding area. According to Anderson, "Some uncontrolled reaction had vaporized methyl isocyanate (MIC), a highly volatile and deadly liquid used in manufacturing pesticides."

Varma said nobody knew exactly how the accident happened except Union Carbide. Anderson contended that Union Carbide sent a fact-finding team but that Indian authorities did not allow them to speak to plant managers. Originally the company blamed the accident on workers. Varma described this as the "wildest fabrication" and questioned how a manual worker could have understood the chemical process.

Another factor which Varma believes contributed to the accident was the lack of trained personnel. Many workers had been moved to other plants because of falling pesticide sales. Anderson had said the accident was "ironic" because Union Carbide was attempting to phase out its Bhopal operation.

Following the Bhopal disaster, a number of chemical companies worldwide, including those in Canada, began to tighten safety regulations. But according to Varma, "The accident didn't touch the Indian government. The major conflict is centred on the issue of compensation.... Environmental issues have never been a major concern of the government.... No political party made Bhopal an issue. We have to break through the mental set that 'we will develop at any cost'."

Varma said people have little faith in the Indian government.

Following the accident, hundreds of barrels of MIC were found, which "should not have been in the plant." The government arranged to have them disposed of and told Bhopalians they could remain safely in the city. "Eighty per cent of the population left the city that day," said Varma.

Last week, an out-of-court settlement between Union Carbide and the Indian government fell through.

Misunderstood, but not forgotten

by Farahad Dastoor

First you forget your keys. Then you start forgetting important phone numbers. Slowly but surely, you lose your ability to cope with the stresses of society.

For hundreds of thousands of Canadians, this scenario is all too real. They are afflicted by a disease known as Alzheimer's.

This misunderstood disease was recently the subject of a lecture by Ms. Bougie, a Board member of The Alzheimer's Society of Montréal, and Dr. Quirion, the Director of Research Laboratories at the Douglas Hospital Research Centre.

Though Alzheimer's Disease (AD) has been known for many years, we have only begun to understand it in the past 10-20 years. In this time, it has been distinguished from the category of diseases known as senility and is now an understandable, discrete disease.

AD strikes those between the ages of 30-50 with the age of onset playing a major role in its progression. Those afflicted later in life tend not to experience the full dev-

The offer of \$500 million in compensation to families of the dead (officially dead) was not accepted by Judge M.W. Deo of Bhopal. Whether the company will face charges of culpability in the gas leak is still to be determined.

The victims of the Bhopal disaster may never be properly compensated. Within a few hours of the accident, people began to die. Ac-

cording to Varma, many were buried in mass graves and this makes it difficult to establish the real number of dead (the official number is roughly 2,000). "Many were cremated or buried even though some were not dead.... At least 5,000 died but so many bodies were truck-loaded that they actually don't know. India uses an old system. Dead is someone with a birth certificate," he said.

astation of the disease, unlike those afflicted earlier.

In North America, there are presently about 2 million cases of AD. This represents only about one per cent of the population. In our rapidly ageing population, these numbers are growing rapidly.

AD was characterized by Bougie as being a "progressive intellectual decline," with a loss of judgement until "nothingness" remains. Diagnosis of AD is very difficult in the early stages, as this period is characterized by minor memory losses. In the latter stages diagnosis of the disease is also difficult and often confirmation can only be made upon autopsy. There is no treatment at any stage of its progression and little external help (physical, psychological, or financial) is available.

AD is psychologically devastating to both the patient and the primary care-giver (person taking care of the patient, often the spouse). As the patient realizes the changes in the beginning (minor loss of recent memory) they become frustrated, anxiety prone, and always nervous about other people's perception of

their behaviour.

As the disease progresses, the patient loses judgement and often needles the care-giver with questions—usually the same one repeated hundreds of times a day. They often pace at night (due to loss of time perception) and ask to go home, even though they are at home.

Because such behaviour often leads to anger and resentment in the care-giver, it is important for the family to seek help from a support

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Football, if you haven't already heard, levitating trains, education environmentalle

Centrespread
Interview with AIDS expert, genetic diversity

events

Women's Union meeting and library party, 423 Union, 17h00.
History Students' Assoc. and the Film Society present *the Mission* in the Alley, 19h30.
Black Students' Network last general meeting, ISA lounge, Union 4th floor, 18h00.
Development and Peace last meeting of the term, 17h00, Union B-09

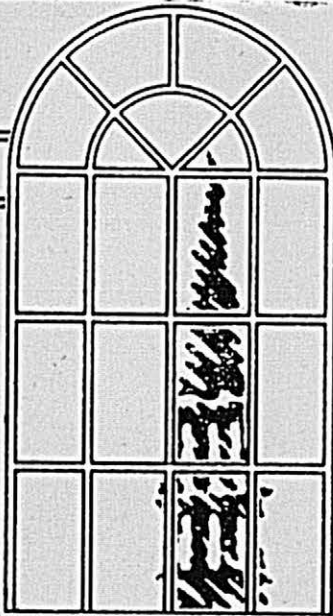


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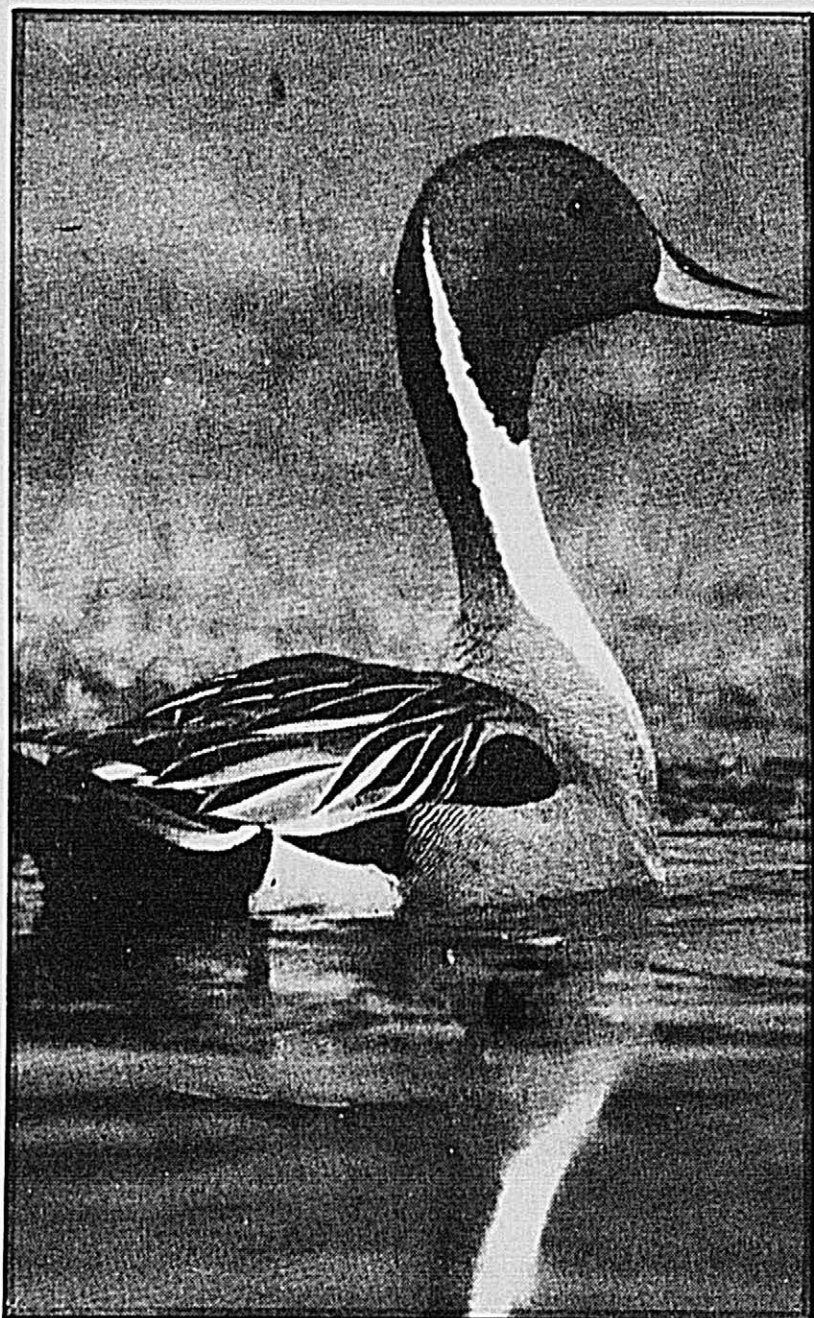
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L'éducation en environnement: un élan?



Isabelle Montpetit

Le gouvernement du Québec a besoin d'une politique concertée en matière d'éducation sur l'environnement. C'est l'avis de l'AQIP (l'Association québécoise d'interprétation du patrimoine) qui, lors de la clôture d'un congrès sur l'éducation en environnement, a réclaté au ministre de l'environnement Clifford Lincoln que son gouvernement se dote d'un énoncé d'orientation dans ce domaine.

Le congrès de la NAAEE (North American Association for Environmental Education), qui s'est déroulé à Québec la semaine dernière, s'intitulait « Point de mire sur l'éducation en matière d'environnement: un élan vers le futur ». Par le biais d'ateliers et de conférences, les participants ont présenté des exemples d'approches efficaces qui pourraient servir de modèles pour l'avenir. On a aussi discuté du processus d'évaluation de l'éducation en environnement, des programmes scolaires de même que des aspects éthiques, philosophiques et religieux d'un tel enseignement.

D'après Pierre-Jules Lavigne de l'AQIP, le gouvernement du Québec éparpille ses efforts; plusieurs ministères et plusieurs organismes privés ont des programmes éducatifs mais l'ensemble manque de coordination et d'une ligne de conduite globale. De plus, le ministère de l'environnement n'a pas de programme d'aide financière aux organismes éducatifs privés comme le Cap Tour-

mente ou le Centre de la Montagne à Montréal, par exemple.

Au niveau scolaire, les efforts sont inégaux. À l'élémentaire, le ministère de l'énergie et des ressources fait la promotion d'un programme, L'Arbre en Tête, qui vise à intégrer les notions de respect et de conservation de l'environnement à toutes les matières. Ainsi, en sciences humaines, on traitera du mode de vie traditionnel des Amérindiens; en mathématiques, on calculera la proportion de régions boisées dans sa région.

Au secondaire, par contre, chaque matière est enseignée par un professeur différent. De plus, le contenu des cours est réglementé, par le régime pédagogique. Il est donc très difficile d'effectuer des changements à l'intérieur des cours.

Ainsi, le ministère de l'environnement a conçu un logiciel sur les pluies acides qui s'adresse à des gens du secondaire et dont on a fait la présentation lors du congrès de la NAAEE. Il s'agit d'un jeu où l'élève est un détective qui enquête sur le problème des pluies acides. Il fait comparaître divers témoins représentant les milieux affectés: l'érable, la grenouille, la

statue. Il étudie ensuite les dossiers suspects et tente d'identifier les coupables. L'élève devient ensuite animateur d'un colloque où différents intervenants sont présents. Après avoir entendu tout le monde, l'élève doit choisir une solution parmi les six qu'on lui propose. Il pourra ensuite connaître les objections des autres participants du colloque à la solution qu'il a choisie. On lui propose enfin des thèmes pour d'autres colloques.

D'après Claude Cloutier du ministère de l'environnement, ce logiciel permettra à l'élève de saisir la complexité des problèmes environnementaux. Malheureusement, d'après Robert Ménard, de l'association des professeurs de sciences, on ne pourrait probablement utiliser le logiciel qu'en secondaire 1, bien que celui-ci fasse appel à des notions qui sembleraient un peu complexes pour des élèves de 12 ou 13 ans, à cause de la structure des programmes.

En attendant, à l'Association Québécoise de lutte contre les pluies acides, on n'avait pas encore entendu parler du logiciel. Seroit-ce un symptôme du manque de concertation entre les différents intervenants?...

Hot superconductors

by Pam Duff

Imagine yourself stepping onto a train. The doors shut, the train slowly rises above the rail, then rapidly speeds off to its destination on a silent cushion of air. This levitating train and other such devices will soon be a reality, thanks to the recent advance in superconductor technology.

Superconductors are a class of materials that lose all resistance to the flow of electrical current and gain special magnetic properties when cooled below a critical temperature. Until this year, this critical temperature has been too low for superconductors to be used outside of the laboratory.

The phenomenon of superconductivity was first observed in 1911. Many pure metals were found to exhibit superconductivity at temperatures below -264 degrees Celsius. Alloys containing these metals yield superconducting (intermediate) compounds with higher

critical temperatures.

Most pure metals—those with low melting points and easily obtained in pure form—are called Type I superconductors. Many alloys and the more complex metals are classified as Type II, due to the way they are affected by magnetic fields.

In 1933, the Meissner Effect was discovered. In the presence of a magnetic field, a superconductor excludes all magnetic flux. The field lines of the flux are bent around the superconductor. If a magnet is placed on a superconducting surface, it will float above the surface if its weight is small in comparison to its magnetic strength. It is this property that will make levitating trains possible.

The main problem with the Meissner Effect occurs if the magnetic field is too strong. In that case, the superconductor can no longer bend the field lines, no matter how low the temperature may be. Type II superconductors are able to re-

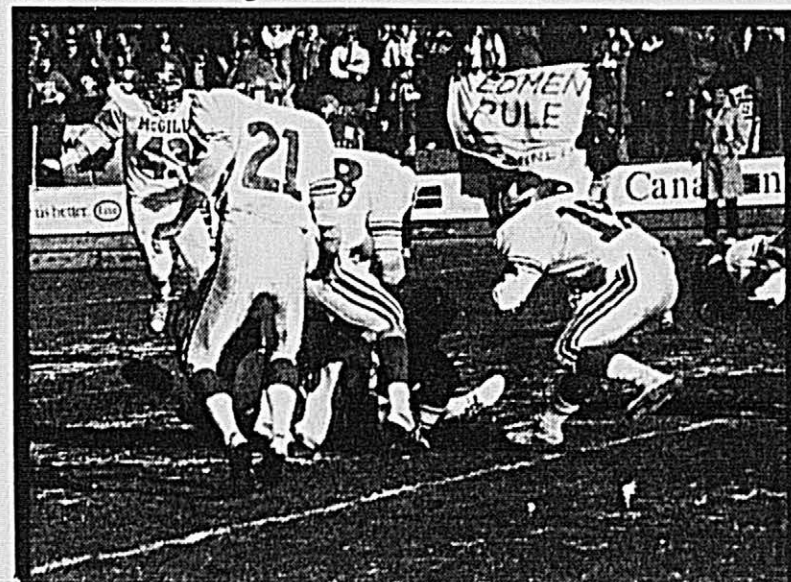
main in the superconducting state in much higher magnetic fields than Type I.

Superconductors will become very useful in many areas when high critical temperatures and magnetic fields are reached. The Nobel Prize in Physics for 1987 was awarded to the Bell Laboratories Group for finding a superconductor with a high critical temperature of -177 degrees Celsius.

This new Type II superconductor is a ceramic rather than a metal alloy. Now that scientists know that ceramics can be superconductors at high temperatures, every day brings us closer to a superconductor that will work at room temperature.

Applications of superconductors are wide-ranged. Large magnets made of superconducting coils can be used to generate electricity without power loss in the magnets. The electricity can be transmitted down superconducting lines to homes and businesses with little or no

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Daily Photo—Gary Rush

The Milkbone Theory

by Susie Petersiel

The Milkbone theory: Dog biscuits can not only make your teeth stronger, but they have proven effective in making the McGill Redmen defensive and offensive lines that halted UBC's thunder, and created the most lopsided win in the history of Vanier Cup football, 47-11.

Corollary to the theory: Milkbones help break and tie records, such as being the first Québec team to win the Vanier Cup, individual scoring of the most touchdowns (3 for Gerry Ifill, a tie),

getting the longest interception return for a touchdown (67 yards, by Wayne McRae, his first ever TD, and his final game with the team), rushing for the most yards in a game (203 for Mike Soles, a career high), and scoring the most touchdowns (6, also a tie).

Warning: this theory is still in the test stage. Do not try this at home, as it may induce the ability to defeat football teams unbeaten in 22 games, to win 8 games in a row, and to excite transported McGill fans to the point where they remove their shirts in -10 degree weather.

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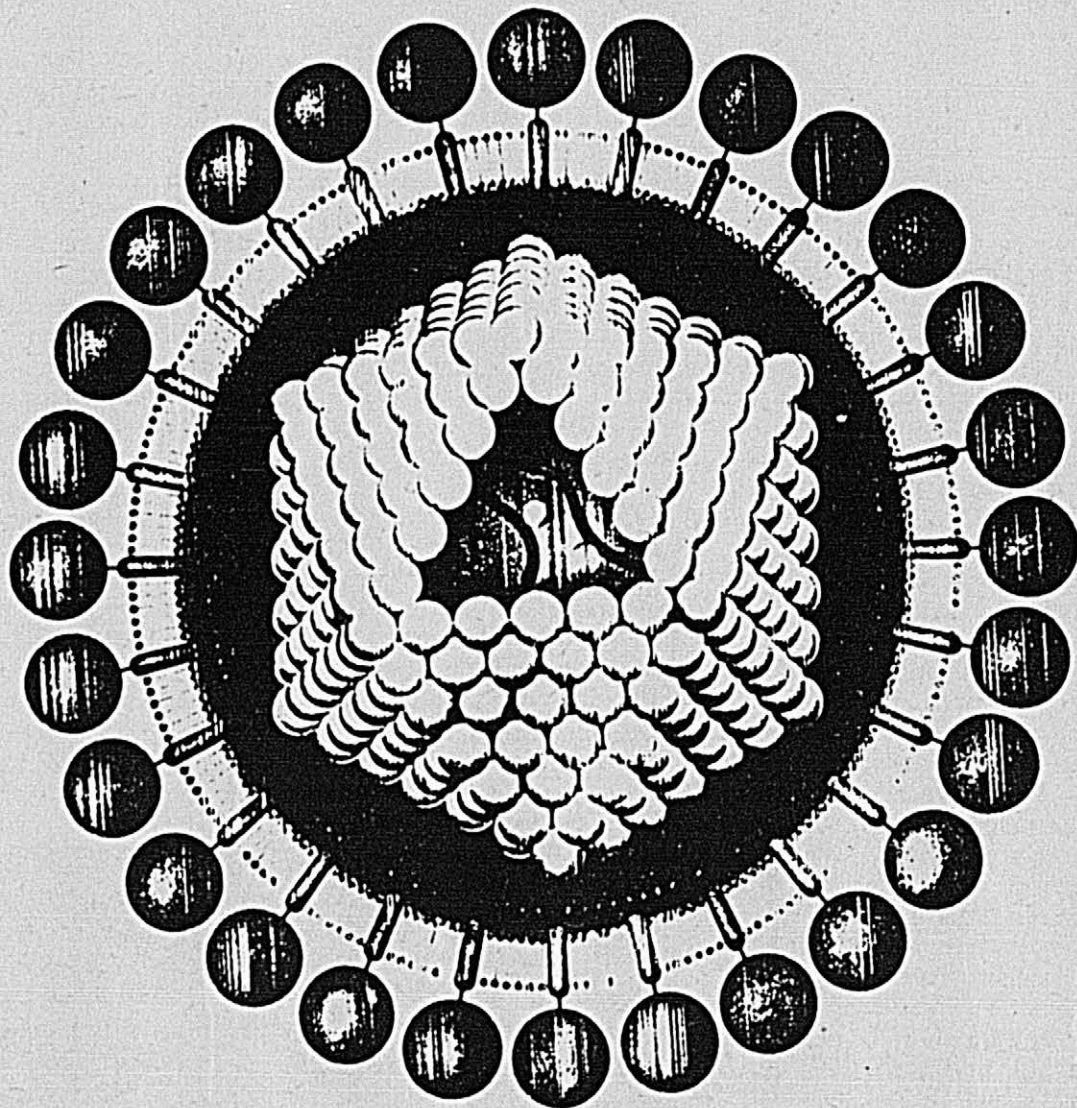
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The Daily is a founding member of Canadian University Press (CUP), Presse étudiante du Québec (PEQ), Publi-peq and CampusPlus.

From viral replication to vaccines

AIDS

by Donald Rossiter
and Paul A. White



Research into Acquired Immune Deficiency Syndrome (otherwise known as AIDS) has moved remarkably fast. Only three years after the disease was first described in 1981, it was shown to be caused by the third human retrovirus HIV-1 (Human Immunodeficiency Virus-1).

McGill's Professor Norbert Gilmore is one of the leading figures in Canadian AIDS research and chairperson of the Canadian National Advisory Committee on AIDS. The *Daily* spoke with Dr. Gilmore at length last week, discussing everything from the most recent medical advances to the current social impact of the disease.

Daily: What is the status of the drug AZT (azidothymidine) in Canada? Is it freely available to AIDS patients?

Gilmore: Yes, it is readily available as an experimental drug and anyone who can fit the specific criteria is eligible to receive it. That includes people that are infected with the virus, who have evidence that their immune system has been severely damaged by it, and who are symptomatic from that damage. That does not include everyone who is infected with the virus. The reason why its administration is restricted is that the drug has severe side-effects and is potentially quite toxic.

Daily: Has it proven effective as a treatment?

Gilmore: The most recent data in the *New England Journal of Medicine* suggests, one, it does prolong life and two, it seems to diminish the frequency of serious side-effects or infections that occur. However you've got to balance that with

the serious side-effects... for some patients quite effectively. It is in there is an optimum time for administering the drug and we define when that would be.

Daily: How is it AZT with the reverse transcriptase without affecting replication?

Gilmore: It will interfere with cell replication if given before the virus has an enzyme (its genetic information from RNA to DNA. All off going from DNA to RNA... to make the AIDS virus) starts off before that and has to material, RNA, into DNA. It can turn the cell into a more virus; that requires reverse transcriptase.

The enzyme (reverse transcriptase) that the virus carries is sensitive to AZT, much similar (but not identical) to the enzymes that are involved in normal cell replication. It can profit on this difference (to AZT) but we must use a drug at a dose which will have an effect on viral replication at the same time minimizing normal cell replication... dose as high as we can, see toxicity to bone marrow, reduces red blood cells... to the point where transfusions are necessary... it's a trade-off with this type of drug.

Daily: Why is it so difficult to develop a vaccine for the retrovirus? Is it believed to be the cause of AIDS?

Gilmore: The problem tends to change, mutate. You want to call it, as it

continued from page 1

...Alzheimer's

group in the community. The Alzheimer's Society runs various workshops and self-help groups for the families trying to cope with AD.

In the final stages of the disease, all independence is lost and the patient will have to be placed in a nursing home or psychiatric hospital. At this point the patient is physically violent and lacks temporal orientation.

The most humiliating aspect of the disease for many is the legal assessment, by the Public Curator, of the patient's mental incompetence. This is necessary in Québec to acquire power-of-attorney from the patient. A common scenario is one in which the curator comes into a home, asks the patient a few questions, labels him or her incompetent (to their face), shakes hands, and leaves.

Some believe that aluminum, present in many household utensils, can cause AD. However, Quirion does not feel that aluminium is a major factor in the disease.

There is currently a lot of research going on to find the cause and cure for AD. Quirion was initially stimulated to study AD due to the lack of previous research.

The reason so little is known about AD is that the disease is not easy to define within finite parameters. In case histories, there does not appear to be any definite pattern. The full disease cycle has not been characterized as patients die at different stages.

In all types of research, one tries to

obtain an animal model that closely mimicks the disease in humans. But there is no good model for AD at present.

But recently a human brain bank was set up at the Douglas Hospital in Verdun. It contains many AD patients' brains donated by their families.

The morphology of an AD brain is very different from that of a normal one. Visually there is an increased density of plaques (areas of dead cells) in the cortex. The main areas affected in the brain are the hippocampus (site of memory and learning) and the cortex (site of higher functions such as sight, judgement, speech, etc.).

On the cellular level, there is a loss of cells from the Nucleus Basalis of Minors (NBM). Loss of cells *per se* is a natural phenomenon in ageing. However, in AD the loss is very dramatic.

The first neurotransmitter discovered, acetylcholine (ACh), has been linked to AD. With age, ACh levels drop, especially in the cortex. Hence, there is a block in transmission of messages between the effector organs and the NBM and cortex. This block in transmission results in loss of control of bodily functions (e.g., incontinence) and judgement.

From such findings, it was hypothesized that the cell body (the source of neurotransmitter) dies first. It is now believed that the problem lies elsewhere. Presently, research is being carried out to determine if neurotransmitter receptors are affected and where they are localized. Once the receptors have been localized and characterized, treatments can be proposed and tested.

A dive in the gene pool: hu

by Alison Hunter

In these days of 'designer' genes, when we are able to tailor organisms to our needs by splicing in genes from sources as distantly related as tobacco and fireflies, we are just beginning to appreciate the wealth of genetic resources of this planet. Ironically, even as we learn to make full use of these resources, they are being threatened.

There are two overlapping areas of concern:

- The loss of variety within economically important species.
- The destruction of many different species, most of which grow in tropical rainforests.

Eighty-five per cent of the world's food supply is derived from only eight species of plants (wheat, rice, corn, potato, barley, sweet potato, cassava and soybean). Yet some of these very important species may become threatened by low genetic diversity.

"Genetic resources stand between us and catastrophic starvation on a scale that we cannot imagine," said Jack Harlan, an agronomist at the University of Illinois. "Yet most of our so-called world collections are sadly deficient in wild races. As we obtain more and more useful results from incorporating wild genetic resources, the principal bottleneck lies in the paucity of wild germ plasm in our collections."

Genetic diversity is important because different strains provide the raw material from which crop improvements are

made. Crops can be adapted to new soil or climatic conditions, given resistance to a pest, or altered to increase yield.

However, once we have these improved varieties, we still need diversity to combat insects and disease. In five to fifteen years, a pest will overcome any plant's resistance through natural selection.

Modern pest management programmes recognize the futility and danger of applying indiscriminate amounts of long-lasting pesticides. Because pests rapidly develop resistance, these programmes rely on alternatives, such as the use of herbivore-detering crops.

The development of such crops depends on the abundance of wild varieties, which provide the genetic building blocks for future plants. But many of these wild plants' natural habitats are being destroyed. Some researchers warn that this situation will intensify if greater efforts are not made to assess and preserve wild genetic resources.

Norman Myers, a consultant in environment and development, said genetic resources are being lost not only through habitat destruction, but also because subsistence farmers are abandoning cultivation of local varieties in favour of more productive varieties. "The Green Revolution, while an admirable achievement in many respects, is proving a disaster for local genetic diversity," he said.

The highest species diversities are found in the tropics, and many of these species populations consist of only small numbers of scattered individuals. With

large-scale deforestation, many species will become extinct. The rainforests could provide new crops, such as fibres, woods, fuels.

As a timely example, the tropical rainforests may be a key element in the fight against AIDS. A chemical that enhances the immune response is found in the bark of an Amazonian tree used in AIDS vaccine.

Much of the rainforest is being cleared for farmland or tree plantations. According to Simberloff, an ecologist at the University of Illinois, the rate of loss is about 21 hectares per hour.

Modern agriculture has created large areas with a single crop. With a single crop, the food in these areas can rapidly reproduce in large areas. This is true in temperate regions and in tropical regions. The weather in the tropics their population is growing all year.

Because most insects attack one or a few species, plants are usually scattered. The confusion of other species in agriculture is therefore profitable in the tropics. The species, mimicking the rainforest, is viable.

Mixed cultivation is important for other reasons as well. The rainforest's canopy

that it can protect it does work. It is important to note that to start administering it, we're still trying to figure out how to do it.

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em is, the virus , grow, whatever lives in the body.

Over time it changes its outside coating, and that's what the body recognizes when it wants to destroy this virus. The second problem is whether the immune system is able to stop the virus... as it can hide in certain cells, travel off and then dump the virus into another cell without having the body's immune system know this. But the biggest problem we have with developing a vaccine today is we don't have any animal models... all we can do is use man. We're going to have to try some things which we think might be vaccines and see if they work... it's going to be a very slow process.

Daily: Once the viral RNA is reverse transcribed into DNA and integrated into the cellular DNA, is there anyway of attacking it specifically?

Gilmore: This has been looked for, but it is very difficult to do. Once the virus is inside the cell, the body won't know it's there unless it puts something on the surface of that cell that says 'hey, it's infected'—so that other cells around it can identify it as a 'bad' cell. Generally, most viral infections do trigger something so that the cell makes some kind of signal on the outside. Then the body's immune system can come along and destroy it. But since the DNA itself is inside the cell... you can't really identify it that easily. (It is difficult to identify the DNA) and there's really nothing you can do to stop the DNA that's in there... which usually takes over the production of the cell and says, 'make virus'.

Daily: Why does the virus have such a long latent period?

Gilmore: Partly because the virus infects cells which aren't very good at producing virus, probably. Secondly, it tends to become very 'lazy'—it doesn't want to go on and take over the cell to produce more virus... until something happens to that cell and it gets triggered or activated. Thirdly, maybe the body's

immune system is able to destroy a lot of the virus and in destroying a lot of the virus it just takes a long time for the virus to produce enough damage. It's important to realize that you have huge numbers of cells that can get infected and until you destroy off enough of those you don't really notice that you're immunodeficient.

Daily: What do you think of the controversy between Dr. Robert Gallo and Professor Peter Duesberg in the United States, who differ in the belief that HIV is the virus which causes AIDS?

Gilmore: I don't really think there is a real conflict, it's really a difference of opinion. These are two scientists who respect each other but have a different approach. Duesberg is saying there are some very strict criteria about which we can say a virus is responsible for a disease. What Duesberg is saying is that we do not have that absolute proof but we do have a lot of circumstantial proof that suggests very strongly that this (HIV) is the cause of AIDS. Gallo is saying, as you look more and more, we have not found anything that would suggest that it is otherwise, but I think they both realize that absolute proof is not there. I think Duesberg is trying to emphasize that we should not just take everything as given or accepted; let's question everything right down the line. It is important to realize that there may be other things that can confound or contribute to the disease that we are watching and they are very important to keep in mind.

Daily: Do you think AIDS is caused by a single factor, as it seems to manifest itself quite differently in different groups?

Gilmore: This really comes down to the whole question of co-factors; is it genetic? Is it repeated exposure to the virus? Is it other things such as (other) sexually transmitted diseases, the junk

that people shove into their arms when they are shooting up drugs, all the blood products people receive? Are there materials in there which just wear down or stimulate the immune system too much, and consume parts of it?

The immune system may be so busy dealing with these things, that the virus may attack it more easily in some cases... In the end we really don't know why some people develop the disease earlier than others, there may be contributors that we don't really know about: malnutrition, stress, the list goes on and on. This is where Duesberg came along and sort of asked; is there something else that we are totally missing? Is it even possible that HIV is just another virus that comes along while some other process is going on underneath it that we have never defined? We have to ask that question. I think all the evidence so far would suggest that that is not the case, but it has to be looked for. If we knew why it is that people react differently to the virus, we might be able to slow down the damage it does.

Daily: Recently in California there was a report of several men who have reversed their HIV status from positive to negative. What is your reaction to this?

Gilmore: That is not surprising. There are bound to be some people somewhere who will be able to fight the infection off. On the other hand we also know that there is a fairly large number of people who have not fought the virus off, and the virus has gone on to damage their body. Whether these people have totally eliminated the virus from their body, or whether it's just an inability to detect it because it is hidden away somewhere in some other part of the body, we don't know. Undoubtedly though there will be some people who will be able to eliminate the virus from their body. Why? We

don't know, and this is another big question... But you must understand that we have very indirect tools at times to get at that answer, we can't just slice up the body and look everywhere for the virus.

Daily: What exactly are your responsibilities as chair of The Canadian National Advisory Committee on AIDS?

Gilmore: A variety of things... basically to advise the Minister of Health on all of the problems, issues, strategies and activities relating to AIDS in Canada. We try to give the minister advice so that he can do his job, which is really to promote health and protect the public from illnesses of various sorts. We are a group of people with expertise who address the problems associated with AIDS. Our role seems to be changing now and we will be looking at some of the larger issues like the social issues... The issue now has a major social dimension. Sexual activity, drug abuse, blood transfusions and their safety are just a few examples of things that go well beyond a simple health issue of people getting infected and becoming sick... So sexual attitudes, knowledge, and behaviour become a very important issue here... That to some extent is a health issue, but more importantly at times it becomes a social issue.

Daily: As a health issue, how important is dissemination of information about the disease? Is misinformation a big problem?

Gilmore: This is a major health issue. Information needs to go out there: how people can protect themselves, how they can minimize their risks, and also understand when there are no risks present. Particularly in the case of children in school and people in the workplace. Issues like this have to be dealt with very clearly, (people have to know) that there is no risk. Of course, there are no absolute guarantees.

Humanity depletes genetic diversity

on, countless species. These species are being lost, pharmaceuticals, and so forth. It appears that we are losing an essential part of our genetic diversity against AIDS. A

nces the human derived from the tree, and will be tests in Britain.

ests are currently as, cattle ranches, according to Daniel st at Florida State f deforestation is minute.

ists tend to plant ngle variety of a undant, monocultures, pests e, and decimate both in the tropics ns. But in season- pest numbers are er, whereas in the ns can keep grow-

s and diseases at- species, rainforest ered throughout a ies. Monoculture re unlikely to be s. But mixtures of e forest, may be

may be necessary well: under the f leaves there is

little wind, so most species are pollinated by birds, bats or insects. These pollinators cannot survive on one species unless it flowers continuously (which is rare). Brazil nut plantations have been known to fail for lack of pollinators that require alternate hosts.

Another seldom appreciated difference between temperate and tropical forests is their abilities to recover after disturbance. Temperate forests are adapted to frequent disturbance: fire, pest outbreaks, and large-scale wind throws. The system recovers relatively quickly from natural perturbations such as these, as well as from human disturbances such as logging.

Tropical rainforests typically have only limited wind throws, involving few trees. Plants will not grow back quickly when the land is cleared; they cannot grow in the dry, full sunlight, and windy conditions of large clearings. Furthermore, tropical rainforest soil is typically poor and susceptible to erosion. Tropical ecosystems tend to be more fragile than temperate ones.

As our population and the demand for food increases, we are forced to bring marginal lands into agricultural production. New crops are therefore required for areas with low rainfall or soil nutrients.

Legumes, for instance, are associated with organisms that turn atmospheric nitrogen into a form usable by plants. Furthermore, they do not deplete the soil of this precious nutrient. However, legumes have been strangely neglected.

The humble but nutritious soybean was ignored in the west until less than 50 years ago. Now it is the third largest crop in the United States. Its relatives only need someone to champion their cause.

The example of the soybean shows that we are presently not necessarily getting the best out of our precious arable lands. Patterns of crop exploitation often have a historical background that has little to do with the nutritional value of the plant. There are long lists of potential food crops that, with a little research and promotion, could make welcome additions to our dinner tables and fields.

To North Americans far removed from the troubles of the Third World, it seems clear that destruction of rainforests is an error of great short-sightedness. In those countries, however, the issue cannot be removed from the socio-economic and political milieu. Many of these countries have phenomenal foreign debts and population pressures.

Wild plants and animals are viewed as commodities, and widespread poverty makes conservation an unaffordable luxury. The people's attitude to the forest is similar to that of the pioneers who colonized the West. Any schemes for protection must be linked to the solution of the socio-economic difficulties.

Science can tell us the value of the species we are losing. It can tell us where and how big our reserves must be to achieve the maximum effectiveness. It can also tell us how best to manage those reserves. But the solution to the problem of declining diversity will be political.



Ads may be placed through the Daily business office, room B-17, Student Union Building, 9am - 3pm. Deadline is 2pm two weeks prior to date of publication.

McGill students: \$3.00 per day; \$7.00 for 3 consecutive days; \$2.00 per day for more than 3 consecutive days. McGill faculty and staff: \$4.00 per day. *Exact change only, please.* Boxed ads are available at the cost of \$4.00 per ad / per day — no discounts on boxing.

The Daily assumes no financial responsibility for errors, or damage due to errors. Ad will re-appear free of charge upon request if information is incorrect due to our error. The Daily reserves the right not to print any classified ad.

341 — APTS., ROOMS, HOUSING

Furnished bedroom available immediately in 2 storey house with students. \$175 a month includes all utilities, even phone, also washer & dryer, non-smoker. Tom 933-8779.

Apartment to share: large 8 1/2 across park on

Esplanade. 2 bedrooms available. \$240/month utilities included. Grad students preferred (or working folk). 285-8948 or 849-4151.

Sublet spacious 2 1/2. Available January or end of December. Walking distance to McGill. Call after 11pm. 939-9544.

Female wanted to share 6 1/2 with another. Only \$212.00/month. Near Atwater/Lionel Giroux metros (within walking distance). Available Dec or Jan - May. call 937-4281.

NDG 7 1/2 to share - 2 people, 2 cats, and dirt, but then again dirt cheap - \$160. Non-smoking, vegetarian preferred. John 489-5854.

Roommate wanted: large 2 storey house, Atwater/Ste-Anne. Includes utilities/phone - partly furnished. \$190.00. Share with 2 students. Jon, Eva: 931-8553.

4 1/2 sublet, 3650 Mountain. 2 bedroom, quiet, clean, excellent location. \$528/month. Call Spyro or Mika. Day 640-6400 x-1569, Eve 849-4317.

Sublet, métro Longueuil highrise 4 1/2. 2 storey 2 bathrooms, heated, equipped. February 1988 or earlier. Negotiable price. 340-1698, 677-1168.

Room for girl student, 4 minutes walking distance from McGill, furnished, clean, quiet, cooking privileges, \$50 weekly, all included. 845-3984.

Take our lease - please! Big sunlit 4 1/2 (2br) in Plateau available Jan 1 or 15. Recently renovated, hardwood floors, furn. \$550/mo. Really nice! 286-9325, Anne, Paul.

Luxurious building -- very large bright 3 1/2 city view - close to McGill \$775. Sublet starting January 1 to May 1. Call evening 849-8880.

4th person to share large 7 1/2 near Atwater Métro. High ceilings, hardwood floors, newly renovated bathroom. Available Dec 15 or Jan 1. 939-0920 or 848-6786.

343 — MOVERS

Student mover will help you move at a very reasonable cost. Local and long distance. Equipped, storage, insured (weekly Toronto) Call Turan at 747-0307.

350 — JOBS

On-campus travel representative or organization needed to promote Spring Break trip to Florida. Earn money, free trips, and valuable work experience. Call Inter-Campus Programs at 1-800-433-7707.

352 — HELP WANTED

Resort hotels, cruises, airlines & amusement parks now accepting applications for summer jobs, internships and career positions. For information & application; write National Collegiate Recreation, PO Box 8074 Hilton Head Island, SC, 29938.

354 — TYPING SERVICES

Typing Services: English — resumes, \$5.00; letters, \$2.00; term papers and essays, \$1.00/page double-spaced for students. Rachel 933-0078 days & evenings. Near McGill.

Word Processing (Lougheed). Professional service. Courteous, reliable and efficient. Letter-quality printer. Downtown area. Specialize in thesis and research reports. Student & rush rates available. 934-1455.

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356 — SERVICES OFFERED

Willing males and females needed for student haircuts. Supervised by professionals. Wednesdays, 5pm. Cut \$8, perms & colour \$15. Call for appointments, 849-9231. Estetica 2175 Crescent.

McGill Outing Club house in the Laurentians, is a short distance from X-country ski trails and the slopes of St-Sauveur; available for rent by groups. Reasonable rates [negotiable]. Contact Ed 488-6724 [evenings] or MOC office. 398-6817.

Sensation seeking... alcohol, drugs, or certain adventure sports? Let us help you get happily involved in some real excitement. Rick Blatter, Health & Fitness Consultant, 625-1352.

361 — ARTICLES FOR SALE

Fox sale, petite sizes: fashionable clothing, three fur coats: raccoon \$1000, beaver \$850, suede with fox \$450 and jade necklaco \$320. Westmount 934-5452 7 to 9 pm.

Glossy black fur coat for sale. \$175 or best offer. Elegant yet simple, warm as toast. Call Elizabeth, 849-4685, or leave message with room-mates.

Vancouver! Round trip Dec 22 - Jan 4 preferably female but adjustments can be made... \$475 o.b.o. Call 398-9228 please leave name/number, sameday replies.

Inexpensive used desks, bookcases, beds, tables, sofas, dressers, carpets, lamps, etc. Call Richard 844-9077. Store hours: 3pm - 7pm [7days/week] 3563 Aylmer [near McGill].

Wool gloves \$4.95 [black, grey, brown, navy], wool socks 2 for \$5, white wool socks \$4.95, tuques \$4.95, EXXA Military Surplus 550 President Kennedy.

365 — WANTED TO BUY

Will buy used furniture -- including beds, carpets, bookcases, lamps, desks, tables, dressers, sofas, armchairs, etc. Call Richard 844-9077 3pm-7pm. Seven days a week.

*Final Issue:
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that's DEADLINE*

Quebec bursaries



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Ministère de l'Enseignement supérieur
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COLOMBIA 1988-1989 INVITATION TO APPLY

Colombia offers two bursaries to persons wishing to undertake or pursue graduate (M.A. or Ph.D) studies or research in a Colombian institution of university education.

Eligibility criteria

Be a Canadian citizen and reside permanently in Québec, have a working knowledge of Spanish and be already enrolled in a study program at a Québec university.

Application deadline

January 10, 1988

Further details and application forms

Further details and application forms may be obtained from :

- ☐ Service de la coopération internationale (in all Québec universities) or
- ☐ Bourses Québec-Colombie, 1988-1989
Ministère de l'Enseignement supérieur et de la Science
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372 — LOST & FOUND

LOST — Watch Wednesday Oct 28, Peel Pub or Doug Pub. Digital Seiko. Great sentimental value, reward. Call Paul 848-0866 [Midnight Oil].

LOST — ring — "X" college insignia — 1985 — lost McGill campus area — Oct 31, 1987 — reward. 939-0683 — great sentimental value.

LOST — on Saturday Nov 14 in Ger's, a blue Eddie Bauer jacket, ID card in pocket. Please Return. Reward. Call 848-0028, thanks.

FOUND — a beagle puppy with leash & collar, Nov 18 at Loyola Campus. 482-3207.

Whoever took my blue McGill knapsack at the Ski Sale on Friday, no questions asked, I need my notes! Please call 848-0491 or 845-4050. \$10 reward.

LOST — Sanity. Actually, gold link bracelet. Large reward, more than any pawn shop will give. Please call Jacqui at 341-6027 or 340-1031.

374 — PERSONAL

McGill Nightline... listening, information, and referrals... till the wee hours of the morning. 7 days-a-week. 6pm till 3am. 398-6246.

Gay or Lesbian? Need to talk? Peer counselling offered Mondays, Tuesdays, Wednesdays and Thursdays from 7 to 10pm, in Union 417 or call 398-6822.

We're here to listen, we're here to chat — we're here to talk about this and that! McGill Nightline — 398-6246 — 7days, 6pm till 3am.

Jamaica, you know what you be doob'n read'ing week. 8 hot days at Damali Beach Village, Montego Bay. Only \$398.00 + tax. For more info call Adam at 286-7584

Dateline: Faculty Club: who were those half-dressed men in the Billiards Room? Thanks for a lovely evening — you know who you are. Love muffy, Butfy & Bootsie.

Dear Alexia, congratulations on an amazing B&G. Next year, try and stay off those collapsing tables! Love Muffy, Butfy & Bootsie.

383 — LESSONS OFFERED

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French — continental French teacher, would tutor French and Russian. 2 year experience. Sorbonne graduate. Please call 524-8047 weekdays before 8:30am or after 9:00pm.

LSAT/GMAT prep courses for Dec 12 LSAT classes Nov 26, 28, 29. Jan 23 GMAT classes Jan 2, 3. [416] 923-PREP 1-800-387-1262. We offer courses in Toronto, Ottawa and Montreal. *A full day session.

385 — NOTICES

Shakin' Foundations H.I.P. 2 song cassettes available live or studio \$3.00 ea. To order call Fraser 524-0894 or Pete 286-9952 great Xmas gift. Thanks for your support!

Attention photographers: the McGill Photo Society will be holding its 10th Annual Photo Contest/Exhibition on March 14 - 25. Submissions are now being accepted for judging in our office, rm B-06. Deadline for submissions is February 14th, 1988. For more info. Stop by the office or call 848-0028.

387 — VOLUNTEERS

Needed: Contributors and reporters for various Public Affairs productions (eg. science, alternative news, Week in Review) on CKUT FM. No experience necessary. Call Jonathan 398-6787.

Week in Review: an hour-long news analysis show on CKUT FM needs reporters, writers and production people. Call Rod Jacob at 298-6787 or at home 487-3486.

Wanted: Head newsroom editor for CKUT FM's news department. Responsibilities include supervising news files and coordinating newscast content. Organization skills helpful but not necessary. Call Lisa 398-6787.

Twin pairs age 14-40 are needed as paid volunteers for a survey being conducted at McGill University. Survey can be completed through the mail. Call: 849-6814, 6-10pm and ask about the twin study.

Wanted — drummer for rock band. Jamming and occasional gigs. Call Len 933-7725.

392 — PARKING SPACES

Parking for one tiny car available immediately. Minute walk from campus. \$35 monthly 481-8870.

389 — MUSICIANS WANTED

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Quebec bursaries



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POPULAR REPUBLIC OF CHINA 1988-1989 INVITATION TO APPLY

The Popular Republic of China offers three bursaries to persons wishing to pursue postgraduate (M.A. or Ph.D) studies or research in a related field at a Chinese institution of higher education.

Eligibility criteria

Be a Canadian citizen or permanent resident of Canada and reside permanently in Québec. Applicant must also be enrolled in a postgraduate program at a university in Québec.

Application deadline

December 10, 1987

Further details and application forms

Further details and application forms may be obtained from :

- ☐ Service de la coopération internationale (in all Québec universities) or
- ☐ Bourses Québec-Chine, 1988-1989
Ministère de l'Enseignement supérieur et de la Science
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Ministère de l'Enseignement supérieur
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QUEBEC-UNITED KINGDOM 1988-1989 FRENCH SECOND LANGUAGE MONITORS EXCHANGE INVITATION TO APPLY

The United Kingdom offers fifteen (15) French Second Language Monitor positions to interested students for academic year 1988-1989.

Eligibility criteria

Be a Canadian citizen and a permanent resident of Québec, be between 21 and 30 years of age, hold a bachelor's degree, be already registered at a Québec university, have excellent knowledge of oral and written French and a working knowledge of English.

Application deadline

December 14, 1987

Further details and application forms

Further details and application forms may be obtained from :

- ☐ Service de la coopération internationale (in all Québec universities) or
- ☐ Moniteurs ou Monitrices, Québec-Royaume-Uni
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Québec

...superconductor tech

continued from page 3

power loss along the way. A combination of these magnets and super-

conductors which can levitate and power trains over long distances is already in the testing stages.

With new superconducting memory units, computers will be able to operate at much higher speeds and take up less space. Also in the design stage is the Superconducting Supercollider, a particle accelerator which will soon be built in the United States. As superconductors become more available, their uses will be limited by the imagination alone.



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Quebec bursaries



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MEXICO 1988-1989 INVITATION TO APPLY

Mexico offers six bursaries to persons wishing to undertake or continue postgraduate (M.A. or Ph.D) studies or research at a Mexican institution of university education.

Eligibility criteria

Be a Canadian citizen and a permanent resident of Québec, hold a bachelor's degree and be registered at a Québec University. Applicant should also be fluent in Spanish.

Application deadline

January 25, 1988

Details and further information

Further details and application forms may be obtained from:

☐ Service de la coopération internationale (in all Québec universities)
or

☐ Bourses Québec-Mexique, 1988-1989

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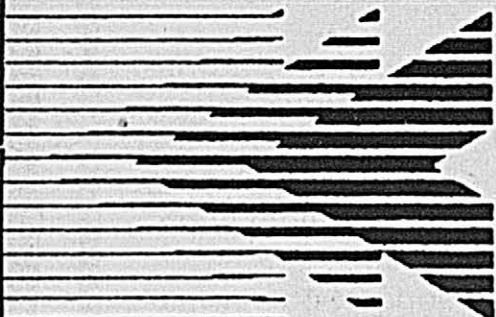
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